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January 18, 2008

California Coastal Commission
Attention: Mark Delaplaine
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219

Subject: **CCC Jurisdictional Delineation for the Foothill Transportation Corridor – South, Orange County, California (Glenn Lukos Associates December 17, 2007)**

Dear Mr. Delaplaine:

The Conservation Biology Institute (CBI) is a nonprofit organization providing scientific expertise to support conservation and recovery of biological diversity through applied research, planning, and community service. I am an aquatic ecologist with over 20 years of experience conducting ecological research, developing species and habitat conservation programs, and preparing impact assessment studies in California. My experience includes conducting watershed-scale assessments of ecological integrity and conservation values for southern California, including the project area. I have previously reviewed and commented on a number of Environmental Impact Reports (EIRs) and Environmental Impact Statements (EISs) for projects in the vicinity of the proposed FTC-S project, and have submitted comments previously on the FTC-S project. I am submitting the following comments concerning the CCC Jurisdictional Delineation for the Foothill Transportation Corridor – South, Orange County California (Glenn Lukos Associates, Inc. 2007). In general the major procedural issues with the previous jurisdictional delineation appear to have been rectified, and my comments will focus on the functional assessment conducted as part of the jurisdictional delineation and the proposed mitigation measures to compensate for impacts to wetland resources in the California Coastal Zone.

Wetland resources affected by the proposed project include those associated with San Mateo Creek, San Mateo Marsh, and San Onofre Creek. They are characterized by a

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mosaic of high quality willow riparian woodland, willow scrub, and coastal freshwater marsh, which are considered sensitive and are regulated by local, state, and federal governmental agencies. More importantly, these wetland resources in the Coastal Zone are located within a larger, biologically rich complex of habitats—that includes vernal pools, coastal sage scrub, coastal chaparral, and native grasslands supporting numerous highly rare and endangered species—within two of the most intact watersheds remaining in southern California (Stallcup et al. 2005). This is reflected by the abundance of special status species in the project area, such as the endangered southern steelhead (*Onchorhynchus mykiss*) and arroyo toad (*Bufo californicus*), that are increasingly rare in human-modified southern California stream systems. Therefore, the wetland-associated communities that lie within the California Coastal Zone clearly meet the definition for an Environmentally Sensitive Habitat Area (ESHA) as defined by the California Coastal Act, as well as within a regionally critical block of natural land, and should receive the highest level of protection possible.

Intact and functional ecosystems in the region are rare and endangered because of the cumulative impacts of the extreme land use changes associated with development, agriculture, and road-building in southern California. The San Mateo and San Onofre Creek watersheds, including the wetland and terrestrial habitats affected by the FTC-S project, are of such high value and natural function because they have largely escaped these impacts. Ecological processes, such as natural hydrologic regimes and fire, only function across large landscapes, such as those represented in the project area, and can be modified by relatively small changes in land cover. The proposed FTC-S project would irrevocably degrade the regionally important wetland and riparian resources supported by these watersheds and impact ecological processes to a level that is not mitigable. The proposed mitigation measures cannot mitigate either the direct or indirect impacts of the project.

The analysis of wetland impacts of the proposed FTC-S project does not address the myriad direct and indirect impacts that the FTC-S project would cause to these wetland resources, adjacent terrestrial habitats, and associated species nor to the region as a whole. The analysis and proposed mitigation focus on direct impacts to individual vegetation community types and do not comprehensively consider the cumulative impacts to wetland functions and values supported by the complex of community types in the impact area. For example, the endangered least Bell's vireo (*Vireo bellii pusillus*), a riparian species, is known to forage in adjacent upland areas. Thus the FTC-S project's impact analysis should also address loss of endangered species habitat quality as a result of loss of adjacent upland habitat quality. In many instances, indirect impacts such as noise, lights, and vibration can be more extensive than direct impacts (Saunders et al. 1991, Blair 1996, Blair 1999, Rottenborn 1999, Pickett et al. 2001). Adverse effects to biological resources at the edges of habitat patches (i.e., *edge effects*) have been documented to extend from 160 feet to as much as 1,500 feet into the interior of the patch (Murcia 1995, Wilcove 1985). In riverine systems, altered hydrology, such as from runoff from the impervious surface cover of roadways, can completely change the structure and function of biological communities within downstream areas (Poff et al. 1997, White and Greer 2001).

Using a conservative assumption of a 160- to 500-foot indirect impact zone, I have estimated that an additional 4.8 to 7.3 acres of wetland and riparian habitat within the Coastal Zone, but outside of the existing Interstate-5 indirect impact zone, would be permanently degraded by the negative indirect impacts of the project (i.e., 4.8 to 7.3 acres of existing undisturbed wetland and riparian habitat would be indirectly impacted by the proposed project). There is also an additional 2 acres to 40 acres of wetland and riparian habitat that lies within the existing indirect impact zone of Interstate 5 that would be degraded further by the indirect impacts of the proposed project. These indirect impacts were not adequately assessed in the environmental documents for the proposed project, nor addressed by Glenn Lukos Associates (1997), and their loss is not adequately mitigated the 1-acre wetland creation project. The analyses presented by Glenn Lukos Associates (2007) greatly underestimate the true magnitude of cumulative impacts to these critically important resources.

The functional assessment that Glenn Lukos Associates (2007) provides in support of their mitigation concept is not only statistically biased and unsubstantiated, but it does not address major functions and conservation values that would be affected by the project. The functional assessment is structured around 21 function metrics, distributed unequally among five major function categories. As scores for each of the 21 metrics are summed to obtain the Functional Capacity Score and individual metrics are distributed unequally among the major functions, this approach is biased against functions described by relatively fewer metrics. For example, the only consideration of landscape context is the metric "Land Use/Land Cover," whose score is swamped by the other 20 metrics. Furthermore, the landscape position and connectivity of the wetlands in the coastal zone, one of the irreplaceable conservation values of these resources, is not adequately quantified in the analysis. There is one metric, "Riparian Corridor," that partially addresses this conservation value, but it alone is insufficient to capture the landscape-scale conservation values that this project would adversely affect, and it too is overcome by the other metrics in the analysis.

The Glenn Lukos Associates (2007) report provides no support for the scores that are assigned for the various metrics, and I question the justification for a number of the scores. For example, the proposed mitigation site (Exhibit 6) is only truly buffered along its northwest side, which is <25% of the site's perimeter, whereas the "Percent Buffer" metric was scored as if buffers were present around 50-75% of the site. Moreover, the buffer zone used in the analysis was 30 feet, clearly inadequate to meaningfully characterize true buffer function. Finally, I would argue that the proposed wetland mitigation site has no buffer functions at all given that it is located adjacent to the proposed project. Uncertainties and lack of justification such as these bring into question the validity of the entire functional assessment.

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The functional assessment also confuses the concept of indirect and temporary impacts. Under the heading "Calculating Loss/Gain of Functional Capacity," the report suggests that "potential indirect impact" was assessed, but rather the report attempts to assess functional capacity of *temporary* impact areas. True indirect impacts of the project—noise and vibrations, lights, altered runoff, generation of dust and contaminants, air quality impacts, etc.—are not assessed and, in fact, are discounted in the scoring of specific metrics (e.g., "Riparian Condition"). There is no evidence presented to suggest that temporarily impacted habitats can be completely restored to their original composition and quality, i.e., that there will be no adverse changes to these temporarily affected habitats that merits scoring "indirect" (temporary) impacts to habitat function metrics as zero in the function assessment (Table 2). For example, the degree of soil disturbance in the temporary impacts area could be so severe that recovery of the current habitat conditions would be impossible, but we have no information to assess the magnitude of the severity. In addition, this analysis does not account for the temporal loss of this mature wetland and riparian habitat, which is not mitigated by the restoration of temporarily disturbed areas.

The eventual functions and quality of the proposed coastal mitigation site cannot be substantiated without more information. However, wetland mitigation sites are generally not similar to those impacted by permitted projects (Ambrose et al. 2006); thus the ability of restoration projects to replace lost wetland functions and values is questionable, particularly so for the high value resources and ecological processes affected by the project. The proposed mitigation site (Figure 2) is a 1-acre area constructed around a detention basin at the end of a relatively narrow finger of existing riparian habitat running along the edge of the proposed project. The proposed mitigation site cannot mimic the ecological processes that have been affected, i.e., the hydrology of the natural channel and floodplains of San Mateo and San Onofre creeks that lie within the temporary impact zone of the proposed project. The proposed mitigation site also lies completely within the indirect impact zone of the proposed project, resulting in permanent indirect impacts from the FTC-S project. It is hard to envision how the proposed mitigation site could have about the same Functional Capacity Score as the existing habitats (e.g., Table1 vs. Table 5), particularly without the details of the wetland creation plan, as is reported in the functional assessment.

To summarize, the Coastal Zone wetland resources that would be impacted by the proposed project lie within a highly diverse, intact, and regionally significant complex of habitats supporting special status species and natural ecological processes. The proposed FTC-S project would cause a significantly greater level of impact to these resources than is acknowledged by the project proponents, and these impacts would not be adequately mitigated by their proposed mitigation measures and may in fact be unmitigable. The functional assessment prepared by Glenn Lukos Associates (2007) is problematic in many respects and does not change this conclusion in any way. There would clearly be a net loss of regionally significant wetland functions and values and "significant disruption of habitat values" within the Coastal Zone wetlands as a result of the FTC-S project, which is in violation of federal and state policies on wetlands protection. The coastal

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zone wetlands and associated natural resources in this area deserve the highest level of regulatory protection, and there are feasible alternatives to the proposed project that would reduce impacts to these wetlands.

Sincerely,

Michael D. White, Ph.D.
Senior Ecologist

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10 January 2008

California Coastal Commission
Attention: Mark Delaplaine
45 Fremont Street
Suite 2000
San Francisco, CA 94105-2219

RE: Proposed Mitigation at Crystal Cove State Park for FTC Toll Road Impacts

Dear Chair and Members of the Commission:

The Conservation Biology Institute is a nonprofit research and planning institution that provides scientific guidance and review for efforts to conserve biological diversity. As a wildlife conservation biologist with relevant experience in the project area, I have commented several times on the biological impacts and proposed mitigation for the Foothill Transportation Corridor South (FTC-S) project. In this letter I comment on a recent development concerning the project, specifically the proposal to mitigate for impacts to coastal sage scrub (CSS) vegetation with restoration or enhancement of CSS at Crystal Cove State Park (CCSP). This proposal is flawed for at least two major reasons: (1) it represents "out-of-kind" mitigation that cannot make up for impacts to a unique coastal habitat mosaic, and (2) there is insufficient opportunity for CSS restoration at CCSP at any rate.

1. Out-of-Kind Mitigation

As I've argued in previous comment letters[1] the mix of sensitive habitats and species that will be impacted by the proposed toll road near the mouth of San Mateo Creek—a mosaic of well-developed riparian wetlands, marsh vegetation, estuarine environs, sandy soils,

[1] See especially my letter of 17 August 2007 to California Coastal Commission regarding Impacts of Foothill Transportation Corridor - South (FTC-S) on Coastal Zone Resources.

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and coastal sage scrub—represents a coastal condition that has become exceedingly rare in southern California. At least five federally listed wildlife species, along with numerous other rare or sensitive species, live in this mix of habitats in areas to be directly and indirectly impacted by the project. San Mateo Creek is one of the last undammed coastal waterways in all of southern California, a major reason it still supports the threatened southern steelhead (*Oncorhynchus mykiss iridius*) and perhaps the largest remaining population of the threatened arroyo toad (*Bufo californicus*), along with numerous other sensitive species. This combination of resources in the coastal zone, within the most undeveloped major watershed remaining in California south of Ventura, and being both contiguous with and part of the largest, most ecological intact block of habitat remaining on California's south coast (Taylor 2004) is unique and irreplaceable.

Although CCSP also supports a valuable mix of both coastal and non-coastal resources, it is quite different from the mix of resources to be impacted at San Onofre State Beach (SOSB) due to differences in geography, extent, configuration, soils, vegetation, and species. In general, riparian vegetation at CCSP is restricted to narrow strips along small, intermittent streams, as opposed to the well developed riparian forests and shrublands along the braiding channels of San Mateo Creek. CCSP also lacks estuarine and freshwater marsh habitats, which occur in association with riparian and CSS vegetation at SOSB. Moreover, the CSS at CCSP does not occur on the types of fine sandy soils that support CSS near the mouth of San Mateo Creek. This is especially important to the critically endangered Pacific pocket mouse (PPM; *Perognathus longimembris pacificus*) which consequently does not occur at CCSP, although it does at SOSB. Likewise, CCSP does not support critical habitat or populations of the threatened arroyo toad (*Bufo californicus*) both of which would be impacted by FTC-S.

Perhaps most significantly, CCSP lies within a much smaller and more isolated open-space block than SOSB, which is contiguous with the extensive lands of Marine Corps Base Camp Pendleton, San Mateo Wilderness, proposed open space on Rancho Mission Viejo, Cleveland National Forest, and other large protected habitat areas in the Santa Ana Mountains and foothills. The large size of the latter habitat block, ranging from high mountains to the Pacific coast, allows it to sustain a much wider range of species and ecological processes than can be sustained in the smaller open-space area comprising CCSP—which is completely surrounded by development.

2. Insufficient Restoration Opportunity at CCSP

I understand that the Transportation Corridor Agency (TCA) is proposing to mitigate for impacts to CSS by restoring 150 acres of CSS habitat at CCSP. However, according to David Pryor, District Ecologist with the California Department of Parks and Recreation (personal communication, 7 January 2008), in accordance with State Park General Plan policies, all appropriate CSS and other habitat restoration at the park is ongoing, and hundreds of acres (including about 220 acres of CSS) have already been restored. The remaining acreage will be restored regardless of TCA's proposal, and the amount of potential additional CSS restoration is only "in the tens of acres" according to David

Pryor (personal communication). Moreover, CSS restoration seaward of the Pacific Coast Highway has already been completed, and the remaining CSS restoration potential at CCSP is limited by appropriate soils to areas inland of Pacific Coast Highway. The largest potential restoration site lies about 1 mile inland, in the El Moro watershed. Conditions there are not comparable to the truly coastal setting of CSS to be impacted at SOSB.

In summary, CSS restoration at CCSP is already being implemented without FTC-S mitigation, and although this represents an important contribution to biological conservation in southern California, the remaining restoration areas are found in a different biogeographic context than the areas to be impacted by the toll road project. Moreover, as I've commented on repeatedly, it is inappropriate to assess impacts to the unique and interacting mosaic of ecological communities near the mouth of San Mateo Creek, as if each community or species of interest is independent of other components. Context matters, and you cannot mitigate the irreplaceable values of this unique coastal ecosystem with piece-meal actions applied to individual components of the ecosystem.

Please feel free to contact me if you have any questions about this letter.

Sincerely,

Dr. Wayne D. Spencer
Senior Conservation Biologist

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17 January 2008

California Coastal Commission
Attention: Mark Delaplaine
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San Francisco, CA 94105-2219

RE: Comments on TCA Responses to Coastal Commission Staff Report for Application CC-018-07

Dear Chair and Members of the Commission:

I'm writing to address responses by the Transportation Corridor Agency (TCA) and their consultants (particularly Dr. D. Murphy and Dr. R.R. Ramey II) concerning the California Coastal Commission Staff Report on the proposed Foothill Transportation Corridor - South (FTC-S) (Application CC-018-07). I focus my observations on issues concerning impacts and proposed mitigation for the Pacific pocket mouse (PPM; *Perognathus longimembris pacificus*) with additional observations concerning impacts outside the coastal zone on coastal zone resources.

My Qualifications

I am first compelled to respond to comments in the TCA responses, and in particular those of Dr. Ramey, which dismissed my previous comments on this project as those of "an activist." The Conservation Biology Institute is a science organization: Our "activism" is restricted to lobbying for the objective and transparent application of best available science to decisions affecting biological diversity in the wild. My professional qualifications are as follows:

I am a wildlife biologist with over 25 years of professional experience in California. I have BS degrees in Wildlife Management and Biology (double major), an MS in Forestry and

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Wildlife Management from UC – Berkeley, and a Ph.D. in Ecology & Evolutionary Biology from the University of Arizona.

I have performed pure and applied research on a variety of rare mammal species in the western US, and have direct field experience in the project area and with species of concern there, especially the PPM. In 1995, I discovered one of the few remaining populations of this critically endangered subspecies (San Mateo South, Ogden Environmental & Energy Services 1995). I have personally logged tens of thousands of trap nights working with all the extant populations of PPM, as well as numerous other locations where PPM were not detected--and I have overseen hundreds of thousands of additional trap nights as a Principal Investigator for PPM studies throughout their range. I directed recovery research for the species for several years (Spencer et al. 2000a, 2000b, 2001, Spencer 2005; Swei et al. 2003); I served as Principal Investigator for the comprehensive base-wide surveys for the species on Marine Corps Base Camp Pendleton (Ogden Environmental & Energy Services 1997) and for a recent study of PPM distribution relative to military training roads in the largest extant PPM population (Spencer 2007). I serve as a Science Advisor to the USGS and USFWS team that is preparing a long-term monitoring and research program for the species (Brehme et al., in prep.). I've also served as a volunteer assisting USFWS with trapping for their intensive population monitoring program in the Oscar One training area.

In addition to my PPM experience, I've studied numerous other rare and not-so-rare mammal species throughout the western US, including pine martens (*Martes americana*), fishers (*Martes pennanti*), kangaroo rats (*Dipodomys* spp, including the endangered *D. stephensi* and *D. merriami parvus*), pocket mice (*Perognathus* spp. and *Chaetodipus* spp.), and grasshopper mice (*Onychomys* spp.). I've studied mammal movements and space-use patterns (Spencer 1981, 1992, Jacobs and Spencer 1991, 1994, Spencer and Barrett 1985), habitat associations (Spencer 1981, 1982, 1987, Spencer et al. 1983, Spencer et al. 2007), foraging behaviors (Spencer and Zielinski 1983, Thompson et al. 1991), food habits (Zielinski et al. 1983), genetics (Swei et al. 2003), competitive interactions (Thompson et al. 1991) and population responses to wildfire (Diffendorfer et al. 2007, Spencer et al. In Prep.). I've studied wild mammals using trapping, telemetry, snow tracking, fluorescent powder tracking, gypsum track stations, hair snares, track plates, seed trays, and night-vision scopes, and I've even studied their brains (Spencer 1992, Jacobs and Spencer 1991, 1994). My Ph.D. dissertation (Spencer 1992) was on space-use patterns and the evolution of spatial cognition in mammals, theories inspired by my experiences trapping, tracking, following, analyzing and thinking about how animals move about, learn about, and use the land (Spencer 1981, 1982, Spencer et al. 1983, Spencer and Barrett 1985).

The sum of those experiences with PPM, and with the movements and space-use patterns of numerous additional species, give me a thorough understanding of what one cannot learn from what is captured, or more importantly what is not captured, in aluminum box traps. This is critical to interpreting the PPM trapping data that the TCA and consultants have placed so much faith in, as I discuss below.

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In addition to my pertinent research experience, I have also led or participated in the planning of numerous regional, multi-species conservation plans throughout California, including several in San Diego County. I have always emphasized a balanced, transparent, and pragmatic approach to conservation planning. This has been widely recognized and appreciated by government agencies, stakeholder groups, and development interests. As a result I have been appointed to serve as the Lead Science Advisor or Science Facilitator for more regional conservation plans under California's Natural Communities Conservation Planning Act (NCCPA) than anyone else. In addition to serving as an advisor to San Diego County on its several multiple species conservation plans (MSCPs) I have served as Lead Advisor and/or Science Facilitator for HCP/NCCP plans for the counties of Yolo, Yuba, Sutter, Merced, Butte, and Santa Clara, and the City of Santa Cruz; and I was recently appointed by California's Undersecretary of Resources to help facilitate the science advisory process for the highly contentious Sacramento Bay Delta Conservation Plan.

Pacific Pocket Mouse

Points of Agreement—The TCA, Ramey, and Murphy responses did get some things right: They are correct that the PPM population at San Mateo north is extremely small, isolated, and threatened with extirpation without protection and intensive, proactive management. They are also correct that many of the management actions that should be initiated need to be implemented carefully, as experiments conducted within an adaptive management framework. Some of the actions recommended in the Resource Management Plan (Ramey and Johnston 2007) are good suggestions and ought to be carried out (e.g., experimental soil augmentation and vegetation management). However, I have some suggestions for refining certain proposed actions and I have serious concerns about the scientific foundations and assumptions underlying others, as detailed below.

Also, while I agree that an adaptive management program along the lines put forth in the Resource Management Plan is necessary, it does not follow that such a plan could not be implemented without the FTC-S project. Moreover, in removing and fragmenting remaining potential habitat areas, the FTC-S project would make it more difficult to meet adaptive management goals for the population relative to the current situation.

Issues with PPM Habitat Suitability Model—TCA's consultants have rolled out a new habitat suitability model for PPM at the San Mateo North site (Ramey and Johnston 2007) which they use to conclude that there is very little habitat potential for PPM in the coastal zone or elsewhere in the vicinity of the known occupied habitat. Although some assumptions of the model have merit, I have serious reservations about the modeling approach and how it is applied to draw conclusions about potential PPM occupancy. This map cannot be used to rule out PPM occupancy from portions of the study area, either currently or in the future, due to uncertainties detailed here.

The biggest concern is with the methods used to map soil suitability—which is the most critical factor influencing PPM distribution. It is well known to PPM biologists, and has been published in the peer-reviewed literature (Spencer 2005) that the USDA Soil

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Conservation Service soils maps (either in their original paper form or via the digital SSURGO database) are much too coarse to depict PPM occupancy at the local scale. They are best applied only at a very coarse resolution to determine the potential that an area (measured over say scores to thousands of acres) *may contain* areas having suitable soil characteristics to support PPM (Spencer et al. 2000, Spencer 2005). These soils maps can *not* be used to rule out potential of an area to support PPM, especially at a fine scale. TCA's consultants should familiarize themselves not only with the soil maps, but with the detailed soil series descriptions in the original documentation (USDA 1973), which have been relied on to conservatively characterize soil suitability in previous PPM studies using *all* soil characteristics likely to affect suitability for PPM (e.g., Spencer 2005).

Soil series polygons contain a lot of internal variability in physical characteristics (e.g., depth, particle size distributions, presence of hardpans). This variability has been empirically shown to affect PPM suitability at a much finer resolution than the mapped polygons. In an intensive study of soil characteristics affecting PPM presence and absence at fine resolution in the Oscar One Training Area of Marine Corps Base Camp Pendleton (the largest PPM population area), the USFWS (M. Pavelka, W. Miller, and C. Winchell, unpublished data) found changes in soil characteristics that affected presence and absence of PPM, at a resolution of one to a few meters, within mapped soil polygons.

Moreover, soil series polygons are labeled based on the *predominant* soil series within them, and *almost always have inclusions of other soil types* that were considered too fine in resolution for mapping by the USDA Soil Conservation Service (1973), but which are large enough to support PPM. For example, one important soil series within the project area—Los Flores loamy fine sand, which supports some PPM here as well as at other PPM sites—contains unmapped inclusions of Huerhuero, Linne, and Diablo soils, which are all quite different in physical and chemical composition than the Los Flores soils (USDA 1973). More important, soil polygons rated by the new model as having low suitability to support PPM are known to support PPM at other sites (e.g., Visalia sandy loams; Ogden 1997).

PPM have also been captured well within the boundaries of other soil types that are generally unsuitable for PPM due to high clay content, hundreds of meters from predicted "suitable" soils. For example, PPM have been repeatedly captured on Huerhuero loams having clay subsoils and vernal pool - mima mound topography in the Oscar One and Edson Ranges (SJM Biological Consultants 2003, Spencer 2007, USFWS unpublished data). PPM can occur in these apparently unsuitable soil polygons because they encircle unmapped inclusions that *are* suitable for PPM.

Because of the unreliability of USDA soil maps for predicting PPM presence and absence, USFWS has repeatedly cautioned their own staff and consulting biologists that these maps cannot be used to rule out potential occupancy by PPM—and I concur.

I anticipate that the TCA and consultants would claim that they verified characteristics of the mapped soil polygons empirically, based on the soil samples they tested. However, they relied on a single soil characteristic (% clay content) to rate soil suitability, and they did not

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sample nearly enough points to characterize the range of variability, nor the presence of smaller inclusions, within any polygon. Although clay content is one key variable for PPM suitability (as rightfully pointed out by Ramey and Johnston 2007) it is not the only one. Depth of the surface soils, proportion of soil in gravel, rock and cobble, sand grain size, and other physical attributes also appear to be important (Spencer 2005; M. Pavelka, C. Winchell, and W. Miller, unpublished data and personal communications). Moreover, the very limited number of soil pits that were dug (Ramey and Johnston 2007, Figure 2) could not possibly account for the range of variability within these polygons. Some polygons in the study area were not sampled at all, and most had only one or two soil pits. Most of these pits were placed near the very edge of polygons, and it appears from the map that they were selected primarily based on convenience (e.g., near roads and trails) and not by a systematic or random sampling scheme. Characterizing variability in critical soil characteristics within any or all of the mapped soil polygons would need to rely on many more samples, ideally using a random sampling scheme.

I also have issues with interpretations of the other three parameters used in the model and how they are combined into an overall suitability index. The interpretation of vegetation suitable to support PPM is overly narrow. The greatest concentrations of PPM in the Oscar One training area are not in scrub communities, but rather in open grassland or ruderal situations, and it is general consensus amongst PPM biologists that PPM do not require shrub cover. Ramey and Johnston (2007) cite my observation that "PPM probably cannot persist in denser shrub communities, wetlands, or woodlands" in support of their model assumptions, but I never stated that PPM cannot persist in grasslands or ruderal areas. Moreover, PPM actually appear to be attracted to disturbed soils, such as along dirt roads, trails, berms, and moderately trampled land (Spencer 2007). This phenomenon is well known in other pocket mice and kangaroo rat species as well, because they favor open and disturbed soils for foraging, travel, sand bathing, and caching, and they favor elevated berms or road edges for burrowing.

Concerning topographic slope, the model assumes, on the basis of a hypothesis attributed to me and on frequency distributions of percent slope categories at capture locations, that the species is not found on steep slopes. However, this hypothesis has not been empirically tested in an unbiased way. An unbiased assessment would require a balanced resource selection function or "preference" analysis (Boyce et al. 2002) that accounts for differential availability and differential trapping effort on the various slope categories. Trappers generally under-sample steeper slopes, which is also evident from the distribution of traplines on Exhibit 2 of Ramey and Johnston (2007). The fact that 10% of captures were on very steep (>30%) slopes seems counter to the hypothesis that PPM avoid steep slopes, especially when it appears that less than 10% of the trapping effort has been on such steep slopes (Exhibit 2).

Finally, I have also hypothesized that PPM may avoid areas that were previously disturbed by agriculture (Ogden 1997, Spencer 2005). Although I still believe there is merit in this hypothesis, it too has not been rigorously tested and should not be accepted as a foregone conclusion to rule out potential for PPM occupancy in former agricultural fields. It is notable

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that many captures at the type locality, near the mouth of the Tijuana River, were in "weedy fields" (von Bloeker 1931 and unpublished field notes of W. Helmuth, 1931) which may have previously been used for agriculture.

In summary, I find the TCA's conclusion, based on the habitat suitability map, that "only 0.6 (six tenths) of an acre of moderately suitable pocket mouse habitat exists in the coastal zone" (TCA 2007, Executive Summary page 7) to be a highly uncertain quantification. There is too much uncertainty in the map's predictive power to conclude that PPM do not or will not occur on areas mapped as low suitability.

Uncertainties in PPM Trapping Data—If there is one thing that many years of trapping experience with this species tells us, it is that PPM are exceptionally variable over both space and time in their detectability using live traps (or any other method), and that their frequently low and unpredictable detectability makes it very difficult to prove absence from a site using trapping surveys. The TCA comments point to the large number of trap nights expended over the years (over 65,000) as confirmation that the mice do not, have not, and cannot have a larger distribution than indicated by the small number of actual capture locations. Numerous factors make this conclusion highly uncertain:

The first is timing. We now know that the presumed active period for PPM (roughly April to September) is extremely variable from year to year, may actually be much shorter in some years, that the sex and age composition of animals above ground changes dramatically over the active period, that different sex and age classes (and even individuals) differ in their "trappability," and that PPM are simply *not detectable* for some time periods, *even within this season*. PPM can and do abruptly enter "facultative torpor" presumably in response to food availability and weather conditions, during the "active season," and at some sites the active season can be very short. For example, Debra Shier (personal communications and presentation at the USGS PPM monitoring workshop on September 6, 2007) trapped for PPM *continuously* from March through October of 2007 on several grids within the known occupied area in the Oscar One Training Area. She reported that following a single, light rain event during early summer of 2007, individuals that she had been reliably capturing suddenly stopped entering traps for a period of 10 nights during which no PPM were captured (suspected torpor). If a trapping survey happened to coincide with such a period of low or no above-ground activity, trapping could seriously under-represent actual species distribution and could wrongly conclude that the species is absent. Moreover, across the four grids she monitored, D. Shier reported that she stopped capturing animals on June 18 on one, July 15 on another, and into early August on the other two. Because the timing of the various traplines shown on Exhibit 2 (Ramey and Johnston 2007) is not labeled, and we do not know at any rate whether PPM were above ground and "trappable" during each trapping bout, one cannot conclude that PPM were proven absent from those areas.

The spatial sampling scheme is also important. It is evident from Exhibit 2 of Ramey and Johnston (2007) that the placement of traplines was rather ad hoc, varied from year to year and place to place, and that large areas (including some mapped as having habitat potential with the new habitat model) were never trapped. For example, few traplines, in few years,

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were trapped east of Cristianitos Road or within the coastal zone, and large areas north of the confirmed occupied area appear never to have been trapped (presumably due to steep slopes). At any rate, the spatial extent of the capture locations in part reflects the spatial distribution of sampling effort. The greatest concentration of effort in most years is focused within the area where the mice were first found. Even given this, and that in some years very few PPM were captured, it is entirely possible that greater effort in other locations would have captured PPM in new locations, including in the coastal zone.

Another consideration is trapping technique. The trapping studies performed at the site were done by multiple personnel having varying degrees of experience. I know from working with and training numerous trappers, including trappers that supplied the data at this site, that they vary in adherence to protocol and attention to detail. At only 6-9 g body weight, PPM are so light that trap treadles must be set to the finest possible trigger response, which is tricky and requires both experience and care. Also, capture success with PPM (and many other small mammals) usually increases following the first, second, or third night that traps are set (presumably because it takes animals time to acclimate to the presence of the trap in their home range and overcome the fear of entering). Protocols developed early on for trapping PPM, and adhered to by seasoned trappers, therefore insisted on leaving traps in place, unmoved for at least five consecutive nights (see Ogden 1997). On that study, I oversaw some field biologists (including at least one that also trapped San Mateo North for TCA) who failed to abide by that protocol by moving trap locations from night to night, on the presumption this would increase captures by continuously testing new ground. However, we know empirically that this is more likely to *decrease* capture probabilities. I don't know to what degree such issues may have affected trapping data at this site, but I suspect that there is considerable unaccountable variance in capture rates for the different traplines, years, and individuals involved, which again calls into question how much confidence we can have in presuming PPM absence from portions of the study area.

Even with the best timing and the best techniques, PPM captures rates can be very low. During June-July 2007 (the peak of PPM activity and detectability that year), I oversaw 12,000 trap nights within the known occupied area in the Oscar One and Edson Training Ranges of Camp Pendleton (Spencer 2007). We recorded only 11 captures of 7 individuals, for an overall capture rate of 0.0009, and we captured no individuals in some areas where PPM have previously been found in fair numbers, and where active burrows and PPM scats were located prior to trapping. Admittedly, 2007 was a very bad year for PPM, due presumably to prolonged drought conditions that have suppressed reproduction as well as above-ground activity during 2006-7 (D. Shier unpublished data, Spencer 2007). Nevertheless, these results illustrate the low probability of captures that can result with this species even with the best possible protocols, because of their unpredictable above-ground detectability.

Finally, results of analyses by USFWS of their unprecedented trapping data set on the Oscar One Training Area (again, the largest extant PPM population) confirm that PPM are highly variable in detectability, with very low detection rates in some times and places, despite animals being present. Monitoring surveys by USFWS have used long trapping durations

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(up to 24 consecutive nights), at multiple times throughout the active season (up to 8 trapping "bouts"), and over multiple years, and using very large, permanent monitoring grids (600 traps at 5-m spacing in 20 x 30 arrays). From these data, the USFWS calculated highly variable (over both time and space) capture probabilities with a rough average of around 0.2. This means that a resident individual on a trapping grid has on average a 1 in 5 chance of being captured on any given night, or that 1/5 of resident individuals may be captured on average in a single night of trapping given these large, intensive arrays. The smaller and more scattered traplines used at San Mateo North stand a greater chance of missing home ranges or active periods of PPM, and may yield even lower capture probabilities.

In conclusion, it is entirely possible that traplines shown on Exhibit 2 of Ramey and Johnston (2007) missed some resident PPM for some or all of the above reasons. Absence of captures does not prove absence of PPM, especially given the dearth of sampling in portions of the study area.

Uncertainties Concerning Proposed Mitigation—Again I want to state that there is merit to many of the recommendations in the Management Plan, but some of the assumptions and conclusions therein are overstated, inaccurate, or of uncertain effectiveness.

Despite Dr. Ramey's protestations to the contrary, the use of culverts as road crossing structures is *completely untested for this species.* Installing culverts would be an experimental treatment with uncertain results, which invalidates this as a "mitigation measure." That said, if this project were to go forward despite its severe adverse effects, I agree that carefully designed culverts should be installed in hopes that they will work; but the statements by TCA and Ramey that the culverts will actually improve connectivity for PPM over the current condition are scientifically unjustified.

Some specific questions and issues concerning the proposed culverts:

- How were the locations chosen, and on what basis was it determined that a culvert at the intersection of Cristianitos and El Camino Real was "most likely" to be used by PPM? That location is approximately 2,600 feet by my measurement from the nearest capture location. That may well exceed expected dispersal distances for PPM (although dispersal distances have not been measured for PPM).
- Ramey's comment letter states that many species of rodents use culverts and undercrossings, and cites several studies. He is correct in general that some mice use culverts, and I am a strong proponent of providing properly designed wildlife undercrossings to improve demographic and genetic connectivity for wildlife species (see for example Beier et al. 2006 and Beier et al. In Press). However, none of the studies he cited involved similar habitats, or heteromyid rodents, or culverts nearly as long as those proposed here. Donald and St. Clair (2004) studied use of culverts, in Canada, by common species of mice and voles that were translocated from their home ranges to near the mouths of culverts to see if they could return home through them. Foresman et al. (2003) studied tracks of various small and medium-sized mammals through culverts *between wetland sites* in Montana. And Mata et al. (2003) studied a

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variety of crossing structures and species in Spain. I don't believe results of those studies can be confidently extrapolated to cover this situation in coastal California, for an extremely rare rodent of open habitats on well-drained sandy soils.

- The longest culvert traversed in the above studies (at least of those where dimensions were listed) was 73 m (240 feet). The three culverts proposed by TCA are up to 525 feet long. This is a very long way for a mouse of open habitats to travel through a pipe.

Ramey (2007) and Ramey and Johnston (2007) conclude on the basis of body size, food habits, and trends in capture data (not normalized in any way to account for trapping effort, timing, location, etc.) that western harvest mice compete with PPM and need to be controlled. This is a *hypothesis worthy of testing*, but it is premature to draw this conclusion. Having participated in some of the studies they tangentially reference concerning competitive interactions between rodents of similar size (e.g., the long-term studies of community interactions in the Chihuahuan Desert by Dr. James H. Brown and colleagues, including me), I find the evidence less than compelling. For example, PPM and harvest mice have very different foraging strategies. Harvest mice "harvest" seeds from living plants, especially grasses, by climbing; pocket mice forage for diverse seeds in surface soil. No one has studied competitive interactions between harvest mice and PPM.

The proposal to salvage soils from cut areas and deposit them within the PPM management zone as an experiment in habitat augmentation has merit, but needs more thought. First, if as concluded by TCA and their consultants grading for the toll road will not affect suitable habitat for the species, which is mostly dependent on soil characteristics, how can soil salvaged from graded areas be suitable for PPM? Moreover, there is anecdotal support for a hypothesis that soil structure (e.g., layering of different soil strata) is important to PPM occupancy. Salvaging and piling soils will mix soil strata, resulting in very different physical characteristics than the natural stratified soils that PPM currently occupy, which may not prove suitable for PPM occupancy.

Concerning vegetation management, Ramey and Johnston (2007) note that prescribed fire has had favorable results for populations of other heteromyid rodents. In general, these favorable results have proven to be short-lived (1 or 2 years), and overly frequent or poorly timed burns can encourage invasive exotic species and degrade habitat value. An experimental prescribed fire was attempted adjacent to the known occupied area at the San Mateo North site in 2000. It was considered a failure, with little increase in habitat value or influx of mice, due at least in part to the fire not removing sufficient surface duff and in part due to rapid invasions by weedy plants (S. J. Montgomery personal communications, and W. Spencer personal observations).

Ramey and Johnston (2007) also discussed the potential for hand thinning of vegetation as an alternative, but failed to cite one such experiment already carried out at the Dana Point PPM site (see Spencer 2005). The hand thinning of vegetation there elicited an immediate, positive, *behavioral* response by individual PPM, which shifted into the newly opened areas.

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However, there was no evidence of a population-level response. Again, these management actions have merit if carried out carefully as adaptive management experiments, but their potential for success is uncertain and therefore cannot be relied upon to mitigate project impacts on PPM.

Effects on Resources in the Coastal Zone

The responses of TCA, Ramey, and Murphy repeatedly suggest that the Coastal Commission should only be concerned with the impacts of the portion of the project that lies within the coastal zone. This approach makes no sense biologically.

The Pacific pocket mouse is a truly coastal species. It was first described from coastal strand, sand dunes, and open sage scrub immediately along the coast (von Bloeker 1931), has never been found more than 6 km from the Pacific coast (Spencer 2005), and still occurs *within the coastal zone* in at least one location (Dana Point Headlands). The FTC-S will impact one and possibly two of four known sites that still support the species, thus affecting the fate of an entire subspecies restricted to coastal habitats. Whether or not PPM have been trapped inside the coastal zone at the San Mateo North site is irrelevant. The project will affect this coastal species, which occupies an environmentally sensitive habitat area (ESHA) that is at least partly within the coastal zone.

Moreover, the natural communities and individuals of species on both sides of the coastal zone boundary are interconnected biologically. Impacts do not spontaneously cease their effects at this artificial line. In the case of the San Mateo North population of PPM, habitat essential for periodic expansion and thus viability of this tenuous population – as well as possibly currently occupied habitat – is contiguous across the boundary. Loss of habitat in one location affects the carrying capacity and biological functioning of the whole.

Conclusions

To sum up these comments:

- The flawed habitat suitability model presented by Ramey and Johnston (2007) cannot be used to conclude that there is little suitable habitat that could be occupied by PPM within the coastal zone or in areas that would be impacted by FTC-S.
- The available trapping data at the San Mateo North PPM site cannot be used to conclude that the species is absent, or cannot occur in the future, within the coastal zone or in areas that would be impacted by FTC-S.
- Although intensive, proactive management of this population within an adaptive management framework should be a high priority, it does not follow that this can only be accomplished if the FTC-S project is implemented, and removal and fragmentation of potential habitat by the toll road would make meeting recovery goals for the population more difficult.

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- Road-crossing improvements would be an experiment with unproven benefits and therefore unsuitable as a mitigation measure. TCA's conclusion that the proposed culverts would improve connectivity for PPM relative to current conditions is scientifically unsupported.
- FTC-S would seriously impact an environmentally sensitive habitat area (ESHA) that is partly inside and partly outside of the coastal zone, and whose community of species interact biologically across the coastal zone boundary.

Please feel free to contact me if you have any questions about this letter.

Sincerely,

Dr. Wayne D. Spencer
Senior Conservation Biologist

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January 16, 2008

Chairman Patrick Kruer
Attention: Mark Delaplaine
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105

Subject: Review of Dennis Murphy Letter and Evaluation of California Gnatcatcher Habitat within Grading Limits Proposed for the Foothill Transportation Corridor Project, Coastal Zone

Dear Chairman Kruer and Members of the Commission,

I have reviewed a letter dated 7 January 2008 that Dennis Murphy submitted to the California Coastal Commission regarding potential impacts of the Foothill Transportation Corridor project on sensitive biological resources located within the coastal zone. In order to evaluate the validity of Dr. Murphy's characterization of the project's likely effects on the California Gnatcatcher in the coastal zone, I inspected five areas of coastal sage scrub that lie within portions of the coastal zone proposed for grading. My qualifications to conduct this review include 19 years as a full-time biological consultant working primarily in Orange County. I am highly experienced in mapping, evaluating, and conducting biological surveys within coastal sage scrub, and have completed numerous focused surveys for the Coastal California Gnatcatcher (*Polioptila californica californica*), a species federally listed as threatened. In 1996, I co-authored with Douglas R. Willick a book entitled *The Birds of Orange County, California: Status and Distribution*. My Curriculum Vitae is attached.

Methods

I conducted a field visit on 12 January 2008 between approximately 1:30 and 3:00 p.m. Weather was sunny and calm. The areas I inspected were located along the shoulder of Interstate 5 in the vicinity of the Cristianitos and San Onofre offramps. I inspected only areas proposed for grading within the coastal zone, as indicated on Figure 4.11-1j in the SOCTIIP EIS/SEIR (an aerial-based vegetation and impact map). I checked each of the patches of scrub that lie within the mapped grading limits, recording the dominant plant species, estimating the approximate aerial coverage of woody plants, evaluating the ecological integrity of the scrub, and obtaining photos. In some cases, the areas in question were too difficult to access on foot, so I inspected them more superficially using binoculars from a distance, or while driving slowly past them. Figure 1 shows the areas I checked.

I evaluated the potential for each stand of scrub to support the federally threatened Coastal California Gnatcatcher. I spent several minutes evaluating each patch of scrub and [illegible] play recorded gnatcatcher vocalizations in an attempt to elicit responses.

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I calculated the approximate acreage of each stand of scrub that lies within the coastal zone impact area using Google Earth Pro.

Results

Figure 4.11-1j in the SOCTIIP EIS/SEIR shows five general areas within the coastal zone that would be impacted by grading for the Foothill Transportation Corridor. I evaluated each of these areas, which are shown below in Figure 1.

Figure 1. Coastal sage scrub areas that I evaluated on 12 January 2008. The approximate boundaries of Areas A through E were adapted from Figure 4.11-1j in the SOCTIIP EIS/SEIR.

I started on the southwestern side of Interstate 5 by walking through Area A, a patch of scrub covering approximately 6.4 acres located between Interstate 5 and Old Highway 1, near the entrance to San Onofre State Beach. The scrub in this area is generally low-growing (roughly waist-high), but with >95% areal cover of native shrubs in most parts (see Figure 2). California Sagebrush (*Artemisia californica*)—the shrub species most frequently used by nesting California Gnatcatchers—accounts for approximately 60%

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shrub cover, Coyote Brush (*Baccharis pilularis*) accounts for roughly 35%, and the remainder consists mainly of Coastal Goldenbush (*Isocoma menziesii*), Lemonade Berry (*Rhus integrifolia*), Coastal Prickly-Pear (*Opuntia littoralis*), and non-native Sweet Fennel (*Foeniculum vulgare*). The generally flat topography and low plant species diversity in Area A suggest that coastal sage scrub became established there in the relatively recent past, probably after the area was graded or otherwise heavily disturbed. I did not detect California Gnatcatchers in this stand of scrub, but in light of its size, relatively flat topography, dominance by California Sagebrush, and proximity to the coast, I regard it as potentially suitable nesting habitat for this species.

Figure 2. Coastal sage scrub growing in Area A is relatively low-growing, and is dominated by California Sagebrush and Coyote Brush. This scrub has low plant species diversity and appears to have become established in this area in the relatively recent past.

I used binoculars to inspect Area B, which consists of two very narrow polygons that cover approximately 6.8 acres along the shoulder of northbound Interstate 5. This scrub is dominated by California Sagebrush, with non-native Fountain Grass (*Pennisetum* sp.) being locally dominant (see Figure 3). Other species observed include Coastal Prickly-Pear, Coyote Brush, and Lemonade Berry. Although dominated by California Sagebrush, the

Figure 3. Coastal sage scrub growing in Area B is dominated by California Sagebrush and non-native Fountain Grass. The scrub grows on a steep, narrow slope above the shoulder of the northbound lanes of Interstate 5.

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narrowness of these strips of scrub, the steepness of the slope they are growing on, and their isolation from other stands of scrub contribute to making Area B marginally suitable, at best, for nesting California Gnatcatchers.

Area C is another difficult-to-access strip of coastal sage scrub located along the shoulder of northbound Interstate 5, but unlike Area B this strip of scrub occurs on a northeast-facing slope. Growing in a moister microclimate, the scrub in Area C is dense and tall (see Figure 4). In this 5.8-acre area, Coyote Brush accounts for roughly 60% of the shrub cover, California Sagebrush accounts for approximately 30%, and the remainder consists mainly of Coastal Goldenbush, Deer Weed (*Lotus scoparius*), Poison Oak (*Toxicodendron diversilobum*), Toyon (*Heteromeles arbutifolia*), and Mexican Elderberry (*Sambucus mexicana*). This scrub could be used by California Gnatcatchers, but it is taller, denser, and more chaparral-like than this species generally prefers.

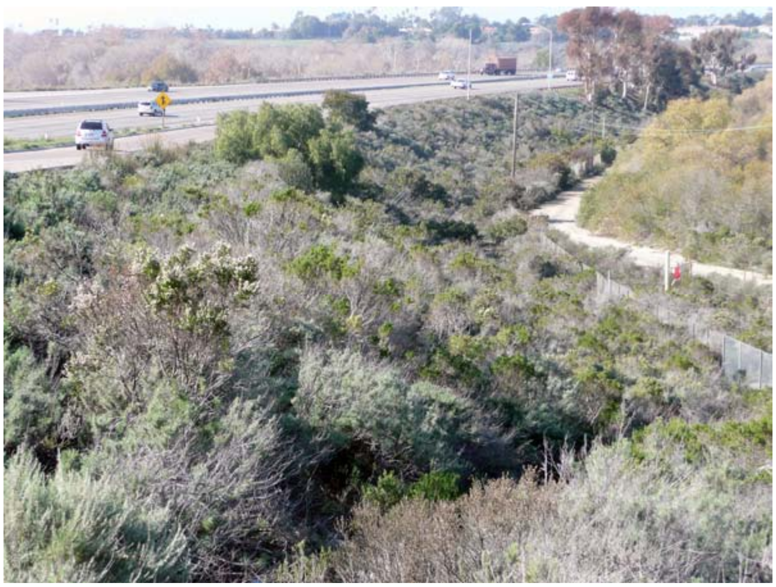

Figure 4. Coastal sage scrub in Area C grows on a northeast-facing slope, resulting in a taller, more chaparral-like community than is found in the other patches of scrub occurring in the coastal zone impact area. The dominant shrubs are Coyote Brush and California Sagebrush.

Area D is a block of coastal sage scrub approximately 13.5 acres in size growing mainly between Cristianitos Road and San Mateo Creek. As shown in Figure 5, this scrub is of high quality, not showing evidence of recent disturbance. California Sagebrush accounts for roughly 75% of the shrub cover, and the other species present include Coyote Brush, Bladderpod (*Cleome isomeris*), California Sunflower (*Encelia californica*), and Mexican Elderberry, which occurs as a co-dominant in a limited area near the stand's western end (near the Cristianitos offramp from Interstate 5). Although I did not detect any California Gnatcatchers in Area D, when I walked through this area I noted that its gentle slopes, dominance of California Sagebrush, and proximity to the coast make the scrub that grows there highly suitable for use as nesting habitat by the gnatcatcher; this species is very likely to occur there.

Area E is a strip of coastal sage scrub covering approximately 7.5 acres that grows on the south-facing slope that runs along the southbound lanes of Interstate 5 at San Onofre State Beach. This scrub is of high quality, with California Sagebrush providing roughly 70% of the shrub cover (see Figure 6). Other species present include Coyote Brush, which is lo

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dominant, Bladderpod, California Buckwheat (*Eriogonum fasciculatum*), and Lemonade Berry. During my brief evaluation of this area I detected two California Gnatcatchers, a male and a female, on different parts of the slope. Figure 7 is a photograph of the female gnatcatcher. The scrub in Area E appears to provide excellent nesting habitat for this species.

Figure 5. Coastal sage scrub growing in Area D is dominated by California Sagebrush, with smaller amounts of Coyote Brush, Bladderpod, and other species. Based on evaluation of its vegetation, topography, and proximity to the coast, I regard Area D as comprising high value habitat for the California Gnatcatcher.

Figure 6. Coastal sage scrub growing in Area E is dominated by California Sagebrush, with smaller amounts of Coyote Brush and other species. I observed two California Gnatcatchers in this area, which I judge as comprising high quality habitat for this species.

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Figure 7. Female California Gnatcatcher photographed in Area E on 12 January 2008. I took this photo near the chain link fence in the area shown in Figure 6 (one of the fence posts is visible in the background).

Analysis

In general, the coastal sage scrub vegetation that I evaluated in the coastal zone impact area for the Foothill Toll Road bears little resemblance to that described by Dr. Murphy. For example, Page 5 of his letter states:

> Those fifty acres of coastal sage scrub include a substantial portion that were previously used in agriculture, hence are currently in degraded condition.

I do not know the land use history of the five stands of coastal sage scrub that I found within the coastal zone impact area, but in four of them I see no evidence suggesting that they might ever have been subject to agricultural practices. With regard to the supposedly "degraded condition" of the scrub:

- Area A, the only area that seemingly might have been used in agriculture historically, has low plant species diversity and is low-growing, but since the area is nearly flat, is located close to the coast, and California Sagebrush dominates, I expect that California Gnatcatchers occur regularly in this area.
- Area B is of marginal value as wildlife habitat, but this is because the scrub in this area grows on a steep, narrow, isolated slope above Interstate 5, not because it was previously used in agriculture.
- Area C consists of well-developed coastal sage scrub/chaparral; whereas the height and density of this vegetation probably makes it unsuitable for use by nesting California Gnatcatchers, the habitat is in excellent condition.
- Areas D and E comprise approximately 21 acres of very healthy, intact coastal sage scrub—habitat that appears to be of high value to California Gnatcatchers. Area D is almost certainly occupied by gnatcatchers, and I confirmed the species' occurrence in Area E.

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Given that scrub habitats proposed for impacts in the coastal zone are generally in good to excellent condition, I perceive no factual basis for Dr. Murphy's blanket characterization of them as being "degraded" or for his assertion that restoration of slopes following project construction would be "likely to produce habitat conditions much superior to those that currently exist."

Continuing in the same paragraph on Page 5 of his letter, Dr. Murphy states:

> Because of [putative habitat degradation] and the proximity of those areas to existing Interstate-5, a significant portion of the existing sage scrub in the project area is not occupied by gnatcatchers.

The notion that "proximity of those areas to existing Interstate-5" is an important factor that would prevent California Gnatcatchers from using otherwise suitable habitat is simply erroneous. For example, the two California Gnatcatchers that I found in different parts of Area E during my field visit were both within ~30 meters of Interstate 5. Furthermore, as summarized by Atwood and Bontrager (2001), California Gnatcatchers are:

> Apparently quite resistant to disturbance once incubation initiated. Slight evidence that fewer nests built and fewer eggs laid in areas with high sound levels produced by fixed-wing military aircraft; no detectable influence of military aircraft noise after nests established and incubation begun (Awbrey and Hunsaker 1997). Successful nesting documented under incoming flight path at major airport, where sound exposure levels often >70 dB throughout day (Awbrey et al. 1995).
>
> Loud construction noise also seems to have minimal effect. Successful nests located 100 m from pile driver (Chambers Group 1995), and <5 m from 2 dirt roads regularly traveled by heavy earth-moving equipment (R. A. Erickson unpubl., DRB). Of 91 nests found at heavily used state park, 13% were <3 m from paved roads or trails; no evidence that such nests failed more frequently than those in less disturbed sites (Miner et al. 1998).
>
> No evidence that California Gnatcatchers increase vocalization rates to compensate for higher ambient noise levels or that birds avoid areas with high noise from highway traffic (Awbrey 1993, Awbrey et al. 1995). Successful nesting documented adjacent to heavily traveled freeway where overall sound level 36 m from highway edge 69.1 dB; at this location, individual located <15 m from freeway's edge would likely be unable to hear typical Mew vocalizations given by another bird 1 m away (see Sounds: vocalizations, above; Awbrey et al. 1995).

Dr. Murphy concludes his analysis of issues related to the gnatcatcher by chiding the Coastal Commission staff:

> Those facts noted, staff's emphatic assertion that the project is "clearly inconsistent" with Coastal Act policy in regards to California gnatcatcher is itself inconsistent with the facts.

As my recorded observations and photographs demonstrate, multiple putative "facts" asserted by Dr. Murphy regarding the gnatcatcher and coastal sage scrub within the coastal zone impact area are demonstrably false. His letter fails to accurately characterize habitat conditions that can be readily observed in the field, and he has misrepresented well-established research findings published in the scientific literature.

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Conclusion

I have documented that, within that portion of the coastal zone that would be impacted by grading for the Foothill Transportation Corridor, four out of five existing stands of coastal sage scrub are generally intact and well-connected to surrounding natural open space areas. Only Area B is too narrow and isolated to be regarded as being valuable as wildlife habitat. The scrub in Area C is lush and healthy, but is probably too chaparral-like to be occupied by California Gnatcatchers. Area A shows signs of prior disturbance, but nevertheless includes approximately 6.4 acres of California Sagebrush-dominated scrub that appears to be suitable for use by gnatcatchers. Areas D and E provide approximately 21.0 acres of high quality habitat for the gnatcatcher. Thus, I have identified approximately 27.4 acres of coastal sage scrub habitat within the proposed limits of grading that I know or expect to support California Gnatcatchers.

If you have any questions or comments, please contact me at 562-477-2181; you may send e-mail to robb@rahamilton.com.

Sincerely,

Robert Hamilton

Robert A. Hamilton
Consulting Biologist

Attachment: Curriculum Vitae

Literature Cited

Atwood, J. L. and D. R. Bontrager. 2001. California Gnatcatcher (*Polioptila californica*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/574.

Awbrey, F. T. 1993. Unpubl. report. Effects of traffic noise on songs and associated behavior of California Gnatcatchers. 14 Nov.

Awbrey, F. T., D. Hunsacker, II, and R. Church. 1995. Unpubl. abstract. Acoustical responses of California Gnatcatchers to traffic noise. Inter-Noise 95: 971–974, Newport Beach, CA.

Awbrey, F. T. and D. H. Hunsacker, II. 1997. Unpubl. abstract. Effects of fixed-wing military aircraft noise on California Gnatcatcher reproduction. Prepared for Acoustical Soc. of America 134th Meeting; Dec.

Chambers Group, Inc. 1995. Unpubl. report. Gnatcatcher monitoring report. Prepared for Sverdrup Corp., Irvine, CA; Jan.

Miner, K. L., A. L. Wolf, and R. L. Hirsch. 1998. Use of restored coastal sage scrub habitat by California Gnatcatchers in a park setting. *Western Birds* 29: 439–446.

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EXPERTISE

CEQA Analysis
General Biological Surveys
Endangered Species Surveys
Avian Population Monitoring
Open Space Management
Bird Banding

EDUCATION

1988. Bachelor of Science degree in Biological Sciences, University of California, Irvine.

PROFESSIONAL EXPERIENCE

1995 to Present. Independent Biological Consultant.
1988 to 1995. Biologist, LSA Associates, Inc.
1987 to 1988. Independent Biological Consultant.

OTHER RELEVANT EXPERIENCE

Field Ornithologist, San Diego Natural History Museum Scientific Expeditions to Central and Southern Baja California, October/November 1997 and November 2003.
Field Ornithologist, Island Conservation and Ecology Group Expedition to the Tres Marías Islands, Nayarit, Mexico, 23 January to 8 February 2002.
Field Ornithologist, Algalita Marine Research Foundation neustonic plastic research voyages in the Pacific Ocean, 15 August to 4 September 1999 and 14 to 28 July 2000.
Field Assistant, Bird Banding Study, Río Ñambí Reserve, Colombia, January to March 1997.

BOARD MEMBERSHIPS, ADVISORY POSITIONS, ETC.

Western Field Ornithologists: Publications Committee & Associate Editor of *Western Birds*
American Birding Assoc. Baja Calif. Peninsula Regional Editor, *North American Birds* (2000-2006)
California Bird Records Committee (1998-2001)
Nature Reserve of Orange County: Technical Advisory Committee (1996-2001)
California Native Plant Society, Orange County Chapter: Conservation Chair (1992-2003)

OTHER PROFESSIONAL AFFILIATIONS

American Ornithologists' Union
Cooper Ornithological Society
Institute for Bird Populations
Southern California Academy of Sciences
Western Foundation of Vertebrate Zoology

PERMITS

Federal 10(A)1(a) Permit No. TE-799557 to survey for the Coastal California Gnatcatcher and Southwestern Willow Flycatcher (renewal filed)
Federal Bird Banding Subpermit No. 20431 (expires 31 January 2011)
State of California Scientific Collecting Permit No. SC-001107 (expires 15 March 2009)

INSURANCE

$2,000,000 liability policy (ITT Hartford)
$1,000,000 auto liability policy (State Farm)

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Principal Professional Qualifications

Perform field work throughout southern California, including 1) floral and faunal surveys, 2) directed surveys for sensitive plant and animal species, including the California Gnatcatcher, Southwestern Willow Flycatcher, and Least Bell's Vireo, 3) open space monitoring and management, 4) vegetation mapping, and 5) bird banding. Recent experience includes:

Since 2007, have worked as the sole biologist reviewing all CEQA documents and landscape plans submitted to the County of Los Angeles Department of Regional Planning. Prepared the Department's approved list of drought-tolerant native plants for use in landscaping throughout Los Angeles County.

Worked with study-design specialists and resource agency representatives to develop the long-term passerine bird monitoring program for the Nature Reserve of Orange County, and have directed its implementation since 1996. This includes 1) annual monitoring of 40 California Gnatcatcher and Cactus Wren study sites, 2) oversight of up to 10 constant-effort bird banding stations from 1998 to 2003 under the Monitoring Avian Productivity and Survivorship (MAPS) program, and 3) focused surveys for the Cactus Wren throughout the NROC's coastal reserve in 2006 and 2007.

Served as the City of Orange's Project Biologist for the Santiago Hills II/East Orange Planned Community project, developed by The Irvine Company near Irvine Lake in central Orange County (SEIR/EIR certified in November 2005).

Having prepared biological technical reports for numerous CEQA documents for projects throughout southern California, I am highly qualified to provide professional, third-party review of CEQA documents. I have professionally reviewed EIRs and other project documentation for the following projects:

- The Ranch Plan (residential/commercial, County of Orange)
- Southern Orange County Transportation Infrastructure Improvement Project (Foothill South Toll Road, County of Orange)
- The Bridges at Santa Fe Units 6 and 7 (residential, County of San Diego)
- Lower San Diego Creek "Emergency Repair Project" (flood control, County of Orange)
- Tonner Hills Planned Community (residential, City of Brea)
- Villages of La Costa Master Plan (residential/commercial, City of Carlsbad)
- Whispering Hills (residential, City of San Juan Capistrano)
- Santiago Hills II (residential/commercial, City of Orange)
- Rancho Potrero Leadership Academy (youth detention facility/road, County of Orange)
- Saddle Creek/Saddle Crest (residential, County of Orange)
- Frank G. Bonelli Regional County Park Master Plan (County of Los Angeles).

References provided upon request.

Selected Presentations

Hamilton, R. A., Mitrovich, M. J. 2006 Cactus Wren Study, Nature Reserve of Orange County. Twenty-minute Powerpoint presentation given at the Nature Reserve of Orange County 10th Anniversary Symposium, Irvine, California, 21 November 2006.

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Hamilton, R. A. 2006. 1999-2004 Results of Annual California Gnatcatcher and Cactus Wren Monitoring in the Nature Reserve of Orange County. Twenty-minute Powerpoint presentation given at the Partners In Flight meeting: Conservation and Management of Coastal Scrub and Chaparral Birds and Habitats, Starr Ranch Audubon Sanctuary, 21 August 2004.

Hamilton, R. A. and K. Messer. 1999-2004 Results of Annual California Gnatcatcher and Cactus Wren Monitoring in the Nature Reserve of Orange County. Twenty-minute Powerpoint presentation given at the Partners In Flight meeting: Conservation and Management of Coastal Scrub and Chaparral Birds and Habitats, Starr Ranch Audubon Sanctuary, 21 August 2004; and at the Nature Reserve of Orange County 10th Anniversary Symposium, Irvine, California, 21 November 2006.

Hamilton, R.A. and K. Messer. 1999-2001 Results of Annual California Gnatcatcher Monitoring in the Nature Reserve of Orange County. Twenty-minute Powerpoint presentation given at the Western Field Ornithologists' annual meeting, Costa Mesa, California, 11 October 2002.

Hamilton, R.A. Preliminary results of reserve-wide monitoring of California Gnatcatchers in the Nature Reserve of Orange County. Twenty-minute Powerpoint presentation given at the Southern California Academy of Sciences annual meeting at California State University, Los Angeles, 5 May 2001.

PUBLICATIONS

California Bird Records Committee (R. A. Hamilton, M. A. Patten, and R. A. Erickson, editors.). 2007. Rare Birds of California. Western Field Ornithologists, Camarillo, CA.

Hamilton, R. A. and P. A. Gaede. 2005. Pink-sided Gray-headed Juncos. *Western Birds* 36:150-152.

Mlodinow, S. G. and R. A. Hamilton. 2005. Vagrancy of Painted Bunting (*Passerina ciris*) in the United States, Canada, and Bermuda. *North American Birds* 59:172-183.

Erickson, R. A., R. A. Hamilton, S. González-Guzmán, G. Ruiz-Campos. 2002. Primeros registros de anidación del Pato Friso (*Anas strepera*) en México. Anales del Instituto de Biología, Univ. Nacional Autónoma de México, Serie Zoología 73(1): 67-71.

Hamilton, R. A. and J. L. Dunn. 2002. Red-naped and Red-breasted sapsuckers. *Western Birds* 33:128-130.

Hamilton, R. A. and S. N. G. Howell. 2002. Gnatcatcher sympatry near San Felipe, Baja California, with notes on other species. *Western Birds* 33:123-124.

Hamilton, R. A., R. A. Erickson, E. Palacios, and R. Carmona. 2001+. *North American Birds* quarterly reports for the Baja California Peninsula Region starting with the Fall 2000 season.

Hamilton, R. A. 2001. Book review: The Sibley Guide to Birds. *Western Birds* 32:95-96.

Hamilton, R. A. and R. A. Erickson. 2001. Noteworthy breeding bird records from the Vizcaíno Desert, Baja California Peninsula. Pp. 102-105 *in* Monographs in Field Ornithology No. 3. American Birding Association, Colorado Springs, CO.

Hamilton, R. A. 2001. Log of bird record documentation from the Baja California Peninsula archived at the San Diego Natural History Museum. Pp. 242-253 *in* Monographs in Field Ornithology No. 3. American Birding Association, Colorado Springs, CO.

Hamilton, R. A. 2001. Records of caged birds in Baja California. Pp. 254-257 *in* Monographs in Field Ornithology No. 3. American Birding Association, Colorado Springs, CO.

Erickson, R. A., R. A. Hamilton, and S. N. G. Howell. 2001. New information on migrant birds in northern and central portions of the Baja California Peninsula, including species new to Mexico. Pp. 112-170 *in* Monographs in Field Ornithology No. 3. American Birding Association, Colorado Springs, CO.

Howell, S. N. G., R. A. Erickson, R. A. Hamilton, and M. A. Patten. 2001. An annotated checklist of the birds of Baja California and Baja California Sur. Pp. 171-203 *in* Monographs in Field Ornithology No. 3. American Birding Association, Colorado Springs, CO.

Ruiz-Campos, G., González-Guzmán, S., Erickson, R. A., and Hamilton, R. A. 2001. Notable bird specimen records from the Baja California Peninsula. Pp. 238-241 *in* Monographs in Field Ornithology No. 3. American Birding Association, Colorado Springs, CO.

Wurster, T. E., R. A. Erickson, R. A. Hamilton, and S. N. G. Howell. 2001. Database of selected observations: an augment to new information on migrant birds in northern and central portions of the Baja California Peninsula. Pp. 204-237 *in* Monographs in Field Ornithology No. 3. American Birding Association, Colorado Springs, CO.

Erickson, R. A. and R. A. Hamilton, 2001. Report of the California Bird Records Committee: 1998 records. *Western Birds* 32:13-49.

Hamilton, R. A., J. E. Pike, T. E. Wurster, and K. Radamaker. 2000. First record of an Olive-backed Pipit in Mexico. *Western Birds* 31:117-119.

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Hamilton, R. A. 1998. Book review: Atlas of Breeding Birds, Orange County, California. *Western Birds* 29:129-130.

Hamilton, R. A. and D. R. Willick. 1996. The Birds of Orange County, California: Status and Distribution. Sea & Sage Press, Sea & Sage Audubon Society, Irvine.

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Hamilton, R. A. 1996-98. Photo Quizzes. *Birding* 27(4):298-301, 28(1):46-50, 28(4):309-313, 29(1): 59-64, 30(1):55-59.

Erickson, R. A., and Hamilton, R. A. 1995. Geographic distribution: *Lampropeltis getula californiae* (California Kingsnake) in Baja California Sur. Herpetological Review 26(4):210.

Bontrager, D. R., R. A. Erickson, and R. A. Hamilton. 1995. Impacts of the October 1993 Laguna fire on California Gnatcatchers and Cactus Wrens. *in* J. E. Keeley and T. A. Scott (editors). Wildfires in California Brushlands: Ecology and Resource Management. International Association of Wildland Fire, Fairfield, Washington.

Erickson, R. A., R. A. Hamilton, S. N. G. Howell, M. A. Patten, and P. Pyle. 1995. First record of Marbled Murrelet and third record of Ancient Murrelet for Mexico. *Western Birds* 26: 39-45.

Erickson, R. A., and R. A. Hamilton. 1993. Additional summer bird records for southern Mexico. *Euphonia* 2(4): 81-91.

Erickson, R. A., A. D. Barron, and R. A. Hamilton. 1992. A recent Black Rail record for Baja California. *Euphonia* 1(1): 19-21.

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